

Title (en)
Stabilizing method of capsinoid

Title (de)
Verfahren zur Stabilisierung eines Capsinoids

Title (fr)
Procédé de stabilisation d'un capsinoïde

Publication
EP 2716624 A1 20140409 (EN)

Application
EP 13002868 A 20060217

Priority
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Abstract (en)
In the production methods of capsinoid by esterification using an enzyme, a method of conveniently obtaining capsinoid in a high yield in a short time without using a dehydrating agent is provided. In addition, a method of stable preservation of produced capsinoid by purifying the obtained capsinoid under stable conditions is provided. A fatty acid represented by the formula (1) and a hydroxymethylphenol represented by the formula (2) are condensed without solvent or in a low-polar solvent, using an enzyme as a catalyst to give an ester compound represented by the formula (3). In addition, a fatty acid represented by the formula (4) is added to the ester compound represented by the formula (3) for stabilization, wherein each symbol is as defined in the specification.

IPC 8 full level
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Citation (applicant)
• JP 2000312598 A 20001114 - MORINAGA & CO
• YAZAWA, S.; SUETOME, N.; OKAMOTO, K.; NAMIKI, T., J. JAPAN SOC. HORT. SCI., vol. 58, 1989, pages 601 - 607
• KOBATA, K.; TODO, T.; YAZAWA, S.; IWAI, K.; WATANABE, T., J. AGRIC. FOOD CHEM., vol. 46, 1998, pages 1695 - 1697
• APPENDINO, G.; MINASSI, A.; DADDARIO, N.; BIANCHI, F.; TRON, G., C. ORGANIC LETTERS, vol. 4, 2002, pages 3839 - 3841
• BANDGAR, B. P.; KAMBLE, V. T.; SADAVARTE, V. S.; UPPALLA, L. S., SYNLETT, 2002, pages 735 - 738
• SUTOH, K.; KOBATA, K.; WATANABE, T., J. AGRIC. FOOD CHEM., vol. 49, 2001, pages 4026 - 4030
• KAGA, H.; GOTO, K.; TAKAHASHI, T.; HINO, M.; TOKUHASHI, T.; ORITO, K., TETRAHEDRON, vol. 52, 1996, pages 8451 - 8470
• J. ORG. CHEM., vol. 54, 1989, pages 3477 - 3478

Citation (search report)
• [X] EP 1069105 A1 20010117 - MORINAGA & CO [JP]
• [X] FR 2721213 A1 19951222 - PF MEDICAMENT [FR]
• [X] JP 2004018428 A 20040122 - MORINAGA & CO
• [XP] WO 2005122787 A1 20051229 - AJINOMOTO KK [JP], et al
• [X] KOBATA, KENJI ET AL: "Enzymatic synthesis of a capsinoid by the acylation of vanillyl alcohol with fatty acid derivatives catalyzed by lipases", BIOSCIENCE, BIOTECHNOLOGY, AND BIOCHEMISTRY, 66(2), 319-327 CODEN: BBBIEJ; ISSN: 0916-8451, 2002, XP002388554
• [X] TRICAND DE LA GOUTTE, JEROME ET AL: "Identification of novel polyphenol oxidase inhibitors by enzymatic one-pot synthesis and deconvolution of combinatorial libraries", BIOTECHNOLOGY AND BIOENGINEERING, 75(1), 93-99 CODEN: BIBIAU; ISSN: 0006-3592, 2001, XP002388555
• [X] IKEDA, RYOHEI ET AL: "Preparation of artificial urushi via an environmentally benign process", BULLETIN OF THE CHEMICAL SOCIETY OF JAPAN, 74(6), 1067-1073 CODEN: BCSJA8; ISSN: 0009-2673, 2001, XP002388556
• [X] IKEDA, RYOHEI ET AL: "Man-made urushi Preparation of crosslinked polymeric films from renewable resources via air-oxidation processes", PROCEEDINGS OF THE JAPAN ACADEMY, SERIES B: PHYSICAL AND BIOLOGICAL SCIENCES, 76B(10), 155-160 CODEN: PJABDW; ISSN: 0386-2208, 2000, XP009068240
• [X] BUISMAN, G. J. H. ET AL: "Enzymatic esterifications of functionalized phenols for the synthesis of lipophilic antioxidants", BIOTECHNOLOGY LETTERS, 20(2), 131-136 CODEN: BILED3; ISSN: 0141-5492, 1998, XP002388558
• [X] MACHO, ANTONIO ET AL: "Non-pungent capsaicinoids from sweet pepper: Synthesis and evaluation of the chemopreventive and anticancer potential", EUROPEAN JOURNAL OF NUTRITION, 42(1), 2-9 CODEN: EJNUFZ; ISSN: 1436-6207, 2003, XP002388559
• [X] ANTONELLA ROSA ET AL: "Antioxidant Activity of Capsinoids", J. AGRIC. FOOD CHEM., vol. 50, 2002, pages 7396 - 7401, XP002388560
• [X] KOUZOU SUTOH ET AL: "Stability of Capsinoid in Various Solvents", J. AGRIC. FOOD CHEM., vol. 49, 2001, pages 4026 - 4030, XP002388561
• [XD] GIOVANNI APPENDINO ET AL: "Chemoselective Esterification of Phenolic Acids and Alcohols", ORGANIC LETTERS, vol. 4, no. 22, 2002, pages 3839 - 3841, XP002388562
• [X] YUKINORI KAWAGUCHI ET AL: "Method of Acid Value Determination for Oils Containing Alkali-Labile Esters", JOURNAL OF OLEO SCIENCE, vol. 53, 2004, pages 329 - 336, XP009068499
• [X] T. PHILIP ET AL: "The nature of fatty acids and capsanthin esters in paprika", JOURNAL OF FOOD SCIENCE, vol. 36, 1971, pages 98 - 100, XP002720914
• [X] CATCHPOLE O J ET AL: "Extraction of chili, black pepper, and ginger with near-critical CO₂, propane, and dimethyl ether: Analysis of the extracts by quantitative nuclear magnetic resonance", MEDICINAL & AROMATIC PLANTS ABSTRACTS, SCIENTIFIC PUBLISHERS, SCIENTIFIC PUBLISHERS, NEW DELHI - INDIA, vol. 51, no. 17, 15 July 2003 (2003-07-15), pages 4853 - 4860, XP009166641, ISSN: 0250-4367
• [X] VESPER H AND NITZ S: "Composition of extracts from paprika (capsicum annum L) obtained by conventional and supercritical fluid extraction", CHEMIE, MIKROBIOLOGIE, TECHNOLOGIE DER LEBENSMITTEL : CMTL = FOOD CHEMISTRY, MICROBIOLOGY, TECHNOLOGY = CHIMIE, MICROBIOLOGIE, TECHNOLOGIE ALIMENTAIRE, CARL, GERMANY, vol. 19, 1997, pages 172 - 177, XP009166636, ISSN: 0366-7154

- [XP] TORRES DE PINEDO, A. ET AL: "Efficient lipase -catalyzed synthesis of new lipid antioxidants based on a catechol structure", TETRAHEDRON , 61(32), 7654-7660 CODEN: TETRAB; ISSN: 0040-4020, 2005, XP002388553

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